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Report to Congress:

Rural Secondary Specialty Demonstration Project

U.S. Department of Health and Human Services
Health Care Financing Administration

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RURAL SECONDARY SPECIALTY DEMONSTRATION PROJECT

EXECUTIVE SUMMARY

Section 9302(d)(4) of the Omnibus Budget Reconciliation Act of 1986 (OBRA) required the Secretary to enter into a 3-year "Rural Secondary Specialty Demonstration Project" with Lake Region Hospital and Nursing Home at Fergus Falls, Minnesota. The statute provided that during the project, payment under Part A shall be made on the basis of average standardized amounts computed for urban areas in the region as adjusted for the rural wage index (same manner as rural referral centers). The Secretary was also required to submit a Report to Congress on the project not later than 6 months after its completion. The report is required to describe the effect that a modified system of making payments under Part A to rural secondary specialty centers would have on:

1. total expenditures under such part; and
2. the access of Medicare beneficiaries located in rural areas to quality health care.

The demonstration was conducted for 3 years beginning October 1, 1986. The Health Care Financing Administration (HCFA) contracted with Mathematica Policy Research, Inc., and its subcontractor, SysteMetrics/McGraw-Hill, to conduct an evaluation of this demonstration. (Appendix A is an evaluation report and

Appendix B is a critique of that report submitted by Lake Region Hospital.) The evaluation was designed to address the following five major research issues relating to Medicare payment and access:

1. Is there a justification for a new rural classification based on the type of criteria proposed by Lake Region Hospital?
2. What role does Lake Region Hospital play in providing services to Medicare beneficiaries in its market area?
3. What would be the impact on access to care and Medicare programmatic outlays should Lake Region Hospital stop providing services?
4. What has been the impact of the demonstration on Lake Region Hospital's finances and its need to cost shift to other third parties?
5. What impact does the severity of case-mix of Medicare inpatients at Lake Region Hospital have on its financial problems?

The major findings of that evaluation are:

1. Based on the criteria proposed by Lake Region Hospital, a new rural classification for hospitals under Medicare is not warranted. Criteria proposed need further review to clarify their intent and consistency with overall goals of the Prospective Payment System (PPS). It would appear that the criteria are specific to Lake Region Hospital only.

2. As a result of the change in payment methodology used in the demonstration, Part A expenditures for Lake Region Hospital increased by over $900,000 for FY 1988. If the rural secondary specialty center classification were implemented nationwide, Part A expenditures may have been over $16 million higher in FY 1988.

3. Access for Medicare beneficiaries would be negatively affected by the closure of Lake Region Hospital. The hospital serves 83 percent of its local community's Medicare discharges. Closure of Lake Region Hospital would increase the travel of Medicare beneficiaries from an average of about 11.5 to as much as 20 miles to access services. Lake Region Hospital provides a higher scope of service than all nearby rural hospitals, and yet, does not serve the most severely ill within the market area which are referred to urban hospitals.

4. Lake Region Hospital's overall operating margin as well as its Medicare operating margin significantly increased since the initiation of the demonstration. The Medicare operating margin for the hospital exceeded 19 percent in both FY 1987 and FY 1988. Without the demonstration, the Medicare operating margin would have been about 2.8 percent in FY 1988.

5. Lake Region Hospital has a higher HCFA case-mix index than similar-sized urban or rural hospitals located in the North Central Region and a HCFA case-mix index

comparable to that of rural referral centers nationwide. However, Lake Region's within diagnosis related group (DRG) complexity measure is lower than either of those comparison groups, i.e., on the average for each DRG the hospital's cases were less complex.

Recommendation

The experience of Lake Region Hospital in this demonstration does not justify proposing the establishment of a new classification of rural hospitals. Very few rural hospitals that do not already have a special rural designation would meet even a subset of the proposed criteria. Also, if Lake Region Hospital had received the rural hospital PPS payment rate, the hospital's operating margins would have been more in line with the national average of all hospitals. In addition, we have no evidence that Lake Region Hospital is in financial trouble and would either close or stop providing medical services to Medicare patients.

RURAL SECONDARY DEMONSTRATION PROJECT

1.0 INTRODUCTION

1.1 Purpose and Scone of Work

The Secretary was required to enter into a 3-year "Rural Secondary Specialty Demonstration Project" with Lake Region Hospital and Nursing Home in Fergus Falls, Minnesota, pursuant to section 9302(d)(4) of the Omnibus Budget Reconciliation Act (OBRA) of 1986, which stated:

> **(A)** ESTABLISHMENT--The Secretary of Health and Human Services (in this paragraph referred to as the "**Secretary**") shall enter into an agreement with Lake Region Hospital and Nursing Home at Fergus Falls, Minnesota, for the purpose of conducting a rural secondary specialty center demonstration project....
>
> **(B)** PURPOSE--The purpose of this project shall be to determine the effect that a modified system of making payments under part A of such title to rural secondary specialty centers would have on--
>
> (i) total expenditures under such part, and
>
> (ii) the access of **medicare** beneficiaries located in rural areas to quality health care.
>
> **(E)** REPORTS--The Secretary shall submit a final report to the Congress on the project not later than six months after the completion of the project.

The statute provides that, during the project, payment under Part A shall be made on the basis of average standardized amounts

computed for urban areas in the region as adjusted by a rural wage index. In effect, the statute provides that Lake Region Hospital will be paid the same as a Medicare-qualified rural referral center.

1.2 **Background**

Lake Region Hospital, a 100 bed acute care facility classified as a rural hospital for Medicare payment, provides both primary and secondary medical services. Lake Region Hospital believes it functions as a rural referral center, but it does not meet the present Medicare criteria. Current Medicare guidelines require a hospital to have at least 6,000 discharges for FY 1986 and 5,000 discharges for FY 1987 to be classified as a rural referral center.

Lake Region Hospital has only about 4,000 total discharges annually. In 1986, Lake Region Hospital commissioned a study to compare its Medicare payment rates and costs with those of urban hospitals. The Lake Region Hospital study found that while its costs were similar to urban hospitals, its payment rates were significantly lower because of Medicare's urban/rural payment rates. Because of its rural designation, Lake Region Hospital received $450 per case less on average for each Medicare inpatient than a comparable urban hospital.

Lake Region stated in its grant application, dated December 12, 1986, that this presented an unrealistic environment in which to operate. Since over 55 percent of its inpatients are Medicare beneficiaries, Lake Region Hospital stated that it could not continue to deliver medical services for which it loses

money. Lake Region Hospital indicated that, without a change in governmental policy, the only alternative available is to stop providing medical services to Medicare patients.

When presented with these findings, Congress asked the hospital to further study the problem and present an alternative solution. Research conducted by Lake Region Hospital concluded that there is a group of rural hospitals experiencing "severe stress" as a result of the current Medicare payment policies. These hospitals have case-mix indices comparable to those of urban institutions but too few discharges to qualify as regional referral centers. As an alternative, Lake Region Hospital proposed to Congress a new classification of rural hospitals to be called Rural Secondary Specialty Centers. This group of hospitals would be classified apart from regional. referral,, centers and sole community provider hospitals. The hospitals meeting the criteria for inclusion in this new classification would be paid in the same manner as rural referral centers (RRCs). The criteria proposed by Lake Region Hospital were:

- a Health Care Financing Administration (HCFA) case-mix index greater than the median national or regional urban level;
- inpatient discharges with age over 65 at least equal to 45 percent of total discharges;
- a medical staff of at least 25 physicians with the percent of active medical staff that are specialists

equal to 50 percent or more, having their primary practice in the hospital community, and:

a) board certified; or

b) completed training requirements for board examinations; or

c) completed residency program in an accredited specialty;

- located within 75 miles of a tertiary acute care hospital and in a county contiguous to an urban area;
- county population greater than 40,000 or more than 15 percent of the county's population is 65 years of age or above;
- bed size greater than 75; and
- total discharges at least 2,650.

Following congressional review of Lake Region Hospital's proposed alternative, a pilot project was mandated in section 9302(d)(4) of OBRA 1986.

To determine the effectiveness of the demonstration, HCFA contracted with Mathematica Policy Research, Inc., and its subcontractor, SysteMetrics/McGraw-Hill, to conduct an evaluation of this demonstration. The findings presented in this report are largely taken from the evaluation report, which is attached at appendix A. Also attached at appendix B is a critique of the evaluation report and its conclusions prepared by Lake Region Hospital.

2.0 NEW RURAL CLASSIFICATION

The criteria that were included in Lake Region Hospital's Report to Congress were derived from factors hospital officials felt reflected the important role that-some nonmetropolitan facilities serve in their local communities. These facilities serve as smaller-scale referral centers for more severe cases, a large percentage-of which are Medicare patients and, therefore, face certain factors that impose relatively high costs. They may not, however, serve sufficient volume to qualify as **RRCs.** Particular emphasis is placed on the higher costs experienced by facilities that must compete with..urban hospitals for professional staff. The proposed criteria included in the legislation were summarized earlier.

Neither the administrative nor empirical review of the proposed criteria justify the use of these particular criteria to create a new rural classification. The administrative review indicated the following:

- The rationale or intent of several criteria are unclear or inconsistent with their assumed intent **(e.g.,** the criteria related to location--county population greater than 40,000 or more than 15 percent of the county's population is 65 years of age or above). There is no indication why population size should be relevant to the issues facing the type of hospitals envisioned for this category. It is also

unclear why an elderly population should be a substitute standard for population size.

- Cut-off points are, in some instances, arbitrary (e.g., eligible hospitals must have at least 75 beds and at least 2,650 discharges).
- Several criteria contain regional biases (e.g., the location in a county that is contiguous to an urban area). The highly uneven geographic size of counties introduces a highly arbitrary and regionally biased element. The State of Georgia, for example, has more counties than all of California, Oregon, Washington and Nevada.
- Case-mix criteria are redundant with those for RRCs (i.e., the case-mix criteria are exactly the same as required for RRCs).
- Staffing criteria could not be easily administered. While these are reasonable standards, the definition of place of "primary practice" may prove difficult to identify. Multiple hospital privileges is the norm for U.S. physicians.

These criteria need further review of their original intent and consistency with the goals of the Prospective Payment System (PPS) as well as their conceptual basis. Although many of them were developed to reflect factors leading to higher costs, they were not substantiated with evidence of a causal relationship.

The 2,604 rural hospitals subjected to the criteria tests were those hospitals identified in the most recently available

crosswalk of HCFA and American Hospital Association (AHA) data on hospital characteristics (based upon 1984 data files). Therefore, the study population may differ from other estimates of the total rural PPS facilities. If there have been changes in provider numbers/hospital IDs from 1984-1986, they would not be included in the merged file. A 98 percent match rate was estimated, however, using the 1984 crosswalk.

Due to the scale of effort needed to measure each of the proposed criteria for all rural hospitals, an estimate of those meeting a significant subset of the proposed standards was made. The following subset of criteria was chosen based on data availability as well as appearing to be the most definitive criteria:

1) a HCFA case-mix index greater than the median urban or regional levels;
2) 75 or more acute-care beds;
3) at least 2,650 total discharges a year; and
4) 45 percent or more discharges covered by the Medicare program.

Another issue regarding the estimate of hospitals, meeting the criteria is missing data. Since it was necessary to use the AHA data files, the nonresponse of certain hospitals posed a problem. In order to be conservative, those with missing data on the criteria were included in the estimates as meeting the criteria.

An upper bound estimate of the number of hospitals meeting the selected subset of criteria nationwide equaled 37. Of those

37, approximately half already have designations as sole community hospitals, RRCs, or both. Thus, their payments are already augmented under PPS, and these hospitals would not be expected to receive higher payments under the proposed new classification. It would appear that the criteria are specific to Lake Region Hospital only.

The estimate of increased Medicare outlays if this small group (20 without RRC status) of hospitals were to be paid on the urban standardized rate (assuming full transition to FY 1988 national rates) was a little over $16 million.

3.0 ACCESS

A major issue surrounding the demonstration is the access of Medicare beneficiaries in this rural area to appropriate hospital care. In its grant application dated December 12, 1986, and comments on the evaluation, Lake Region Hospital indicates that for a facility of its size, it has historically provided unusually sophisticated and high quality services to its service area. Nonetheless, the hospital administrators maintain that financial stress threatens the hospital's ability to continue this role. Given the hospital's proximity to an urban area and the role it plays in serving the more severely ill in the community, hospital staff have stated the only alternative for the Medicare beneficiaries it serves is to access services at nearby urban hospitals. This means increased travel for the sick and frail elderly as well as an overall increase in the outlays of the Medicare program.

This study addresses the access issue in a five-step analysis of Medicare patients' travel patterns. First, the market area of Lake Region Hospital is defined. Travel patterns for the demonstration hospital, as well as those from other hospitals in this market area, are then described. This provides an initial understanding of the role Lake Region plays in its market area. The next step is an analysis of the factors effecting the choice of hospital by beneficiaries accessing services in the market area. The results of this analysis are used to derive estimated probabilities of hospital choice in the event of closure of Lake Region. Finally, the impact on travel and Medicare payments is derived based on these estimated probabilities.

3.1 Market Area

Lake Region Hospital is located in Fergus Falls, Minnesota, a town of approximately 15,000 residents. As the data in Table 3-l show, Lake Region served 83 percent of the Medicare discharges from this community during 1986. It also served from 43 percent to 84 percent (not shown) of those in surrounding communities that do not have a local community hospital. Most of the closest alternative rural hospitals are smaller in size and offer fewer services. Service scope is measured here by a Guttman scale, which ranks a hospital's scope of services from low to high in relation to the sophistication (directly) and frequency (indirectly) among hospitals. That is, the most frequent tend to be the less sophisticated services and score low on the scale; the less frequent and more sophisticated services

Table 3-1

Selected Descriptions and Market Hole of Closest Hospitals

Characteristics	Lake Region	Nearby Rural Less Than 25 Miles: Saint Francis	Nearby Rural Less Than 25 Miles: Grant County	Nearby Rural Less Than 25 Miles: Pelican Valley	Further Rural Less Than 45 Miles: Memorial	Further Rural Less Than 45 Miles: Parker's Prairie	Further Rural Less Than 45 Miles: Wheaton Community	Further Rural Less Than 45 Miles: Douglas County
Acute Beds	100	95	32	13	29	18	35	1 30
% Medicare*	39.68	31.6%	NA	41.59	30.9%	41.21	53.0%	42.13
Guttman Scale	12	7	NA	-3	5	7	5	7
Case-Mix								
HCFA Case-Mix Index	1.1994	1.1036	1.1029	0.8626	1.1641	0.9741	1.0557	1.3353
Across-DRG Complexi ty	1.148	1.018	0.933	0.817	1.158	0.919	1.068	1.230
Within-DRG Conplexi ty	0.991	0.945	0.953	0.927	1.031	0.948	1.031	0.986
Market Role								
Share of Own Communi ty	83.49	66.13	76.2%	46.9%	50.5%	45.8%	33.9%	83.1%

* For Lake Region, percent Medicare As derived from 1986 Medicare Cost Report; for remaining hospitals, data are from 1986 AHA tape.

score high. A scale of 17 items was developed using data from the 53 hospitals in the expanded market area. This index is based on self-reported data from the AHA and, therefore, has some inherent limitations. Still, AHA data are one of the few automated data files available for such analysis and have been widely used in earlier research. Self-reported items ranged from emergency services offered by 98 percent of the market area hospitals to pediatric intensive care units, offered by only 9 percent.

Using this index, Lake Region Hospital maintains a higher scope of service than its neighboring facilities. Lake Region Hospital measured a 12 on the Guttman scale as compared to a range of -3 to 7 for the surrounding rural hospitals. While this enables the hospital to serve the more severely ill patients, it also has implications for its costs. Increased specialization and/or scope means resource management is less flexible, i.e., each specialized unit requires reserve beds to handle unexpected utilization (Gianfrancesco, 1980). The overall utilization rate per bed may thereby decrease and fixed costs per case increase.. Highly skilled specialized personnel may also be underutilized and cannot be easily substituted across units.

It is clear that Lake Region Hospital maintains a higher level of service than its rural counterparts. Compared to the two larger hospitals in the group, St. Francis and Douglas County, Lake Region's higher score is due to the reported availability of X-ray therapy and a therapeutic radioisotope, facility. These are costly services to acquire and maintain.

The two larger hospitals, St. Francis Hospital, 18 miles away, and Douglas County Hospital, 44 miles from Lake Region, nonetheless play important roles in their local communities. Indeed, based on the HCFA case-mix index as well as the refined measure accounting for within-diagnosis related group (DRG) severity, Douglas County Hospital serves a more severely ill Medicare inpatient caseload than Lake Region.

As the data in Table 3-l show, there is a tendency for smaller hospitals to also have lower scopes of service as measured by the Guttman scale, although there are some exceptions. One small hospital, Memorial Hospital, located 34 miles from Lake Region, has a higher across-DRG complexity measure than Lake Region; this hospital serves severely ill patients within medical rather than surgical DRGs. The smaller hospitals generally serve a smaller share of their local community discharges.

3.2 Travel Patterns

The purpose in providing an overview of the travel patterns of Medicare beneficiaries within Lake Region's service area is to capture the flows of the great majority of Lake Region's Medicare patient load and to determine alternative hospitals these patients may choose. The Medicare discharges residing in zip codes in the States of Minnesota, North and South Dakota were examined to determine if they accessed services at Lake Region, St. Francis, and Douglas County hospitals. Only those zip codes from which these hospitals drew at least three discharges were included in the analysis. Douglas County and St. Francis

hospitals were included because they play similar roles to Lake Region in overall market area travel patterns. In addition, other hospitals drawing three or more discharges from these zip codes were identified. This market area consists of 53 hospitals which drew patients from 93 (unduplicated) zip codes in 1986. These 53 hospitals were collapsed into seven major types for analysis, as shown in Table 3-2. Approximately 97 percent of the over 12,000 discharges residing in this market area go to one of these seven hospital types. The overall distribution, average age, relative severity, and average distance traveled by individuals (discharges) accessing each hospital type are shown in Table 3-2.

As the data in Table 3-2 indicate, while the urban hospitals are very important in terms of providing the most sophisticated services for these Medicare beneficiaries, more sophisticated rural hospitals like Lake Region Hospital are very important to the elderly residing in this market area. Around 70 percent of the discharges from this service area travel to either nearby or distant rural hospitals. Medicare beneficiaries residing in a rural area and traveling to an urban hospital are more severely ill than those accessing services at hospitals within the rural area. They are also relatively younger, 68 versus 75 to 77 years of age on average. Further analysis showed this tendency to travel for hospital care varies dramatically by ***age***; those under 75 traveled an average of 33 miles while those over 85 traveled only 12 miles to access services. The average distance traveled

Table 3-2

Characteristics 04 Patient Discharges in Market Area Urban/Rural Hospital Type

	Percent of Total	Age	Across DRG Complexity	Average Distance
1: Distant Urban ffospi tals	6.8%	68	1.654	146
2: Nearest Large Urban ffospital (200t Beds)	JO.39	73	1.317	42
3: Nearest Small Urban Hospital (<200 Beds)	10.59	74	1.315	31
4: Nearest Rural Center (75t Beds)	26.59	77	1.144	12
5: Next Nearest Rural Center (75+ Beds)	1.99	75	1.271	33
6: Nearest Rural Community (<75 Beds)	36.1%	77	I.024	3
7: Next Nearest Rural Community (<75 Beds)	4.99	77	1.060	18

to the most distant urban hospitals is 146 miles. Travel to closer urban hospitals averages 31 to 42 miles. This is in contrast to the 12 miles traveled, on average, to rural hospitals similar in size to Lake Region.

The physician plays a crucial role in the selection of a hospital. Nonetheless, the patient's residence influences the initial choice of a physician; patients are likely to choose one who is geographically close. In turn, physicians do not admit patients at great distances from their practice location. Thus, the patient's residence indicates a lot about the admission process. This is not to say that it would not be useful to include information about physicians, using a rigorous multivariate analysis, but the data for such a study are not available.

3.3 Analysis

The elimination or restriction of services at the demonstration hospital would increase travel for the beneficiaries it now serves and would result in Lake Region's inpatients accessing services at rural hospitals with lower scopes of service, at least initially. The impact on Medicare Part A outlays would depend on the accuracy of assumptions regarding a patient's choice of hospital. The impact under two assumptions, or scenarios, was quantified:

Scenario I. Lake Region Hospital's inpatients, would all travel to urban hospitals; or

Scenario II. Lake Region Hospital's inpatients would access services depending on the characteristics and

location of alternative hospitals as well as their own individual age and relative complexity of illness. Conclusions are based on the above scenarios since it is not possible to positively predict what the behavior of the elderly would be in the absence of Lake Region Hospital. The basis for the assumptions under the two scenarios is different. Scenario I, where all inpatients now served by Lake Region Hospital would travel to urban hospitals for care, is proffered by the demonstration hospital. The second scenario is based on the multivariate analysis of the determinants of hospital choice. This method accounts for the influence of hospital characteristics, resident location, age, diagnosis, and severity of illness. Thus, this scenario is specific to the individual characteristics of the patients now choosing Lake Region Hospital.

Shown in Table 3-3 is the impact of the demonstration and each of the two above scenarios on Medicare's FY 1988 Part A expenditures, average distance traveled by Medicare beneficiaries, and Guttman scale. Although both scenarios result in greater travel distances, the magnitude of these changes is quite different. If, as the hospital asserts, all Medicare inpatients would travel to the closest urban hospital, the average travel would increase by almost 50 miles; Medicare outlays would be higher, relative to the demonstration level, by around $0.6 million dollars in FY 1988. Using just one set of results from the multivariate analysis indicates the changes would be quite different, i.e., that many beneficiaries would

prefer to go to a local hospital. Medicare beneficiaries would travel almost 2l'additional miles and Part A outlays would actually be lower than those incurred during the demonstration. That is, if Lake Region Hospital closed, Part A outlays would ha-ve been approximately $0.2 million less than those paid under the FY 1988 demonstration period.

· Although the latter appears to be a more likely scenario--since distance is a strong deterrent for the elderly--it also indicates the average scope of service capability of the hospitals accessed would be lower. Whether this level of service is of adequate scope, intensity, and quality to meet the needs of the beneficiary population, and whether such alternative service use would be more efficient in terms of the allodation of health care resources, is a complex issue. The analysis of this issue is beyond available data. The data can only be interpreted as lower levels of service capability as reflected in the measure of scope used here--the Guttman scale; however, this is not a measure of quality.

Table 3-3

Change in FY88 Part A Expenditures, Distance Traveled and Guttman Scale of Hospitals Accessed Under the Demonstration and Alternative Access Scenarios

	Demonstration	Scenario I	Scenario II
Change in Part A $	$942,882	$1,592,568	$705,516
Change in Distance	- -	48 miles	20.5 miles
Change in Guttman	---	0	-2.6

4.0 FINANCIAL IMPACT

4.1 Overall Financial Impact

Data on the hospital's overall patient revenues and expenses are presented in Table 4-l. These data show the net position of the hospital (inpatient, outpatient, and nursing home) over 4 fiscal years, 1985 through 1988. According to these data, the hospital has experienced a significant increase in its overall operating margin since the initiation of the demonstration in FY 1987.

Data for 1987 indicate the hospital had a positive net cash flow for patient services. The amount of this net gain was substantial, **$1,628,072.** When the nonpatient revenue is added to this amount, the net gain overall was **$2,449,248.** This resulted in a positive margin as a percent of total patient revenue of 16.5 percent. In 1988, the total net gain equaled a little over $2 million for a margin of 12.7 percent. The hospital has engaged in several activities to improve its competitiveness and service provision during this and earlier time periods. The largest portion of the increase in revenues from 1986 to 1987 was actually derived from outpatient rather than inpatient services. Also, since the hospital was not sure the demonstration would be approved by the time submission for rate increases were due, it did institute a significant increase in its FY 1987 charges. The improvement in the hospital's net revenue position from 1986 to 1988 can, therefore, be attributed to several factors, only one

Tabel 4-l

Total Charges, Revenues, and Expenses for bake Region Hospital and Nursing Home, Fiscal Years 1985, 1986, 1987 and 1988

	Fiscal Year 1985	Fiscal Year 1986	Fiscal Year 1987	Fiscal Year 1988
Gross Patient Charges	$14,417,982	$15,554,254	$17,285,693	$19,692,731
Net Patient Revenues	$12,184,515	$12,571,977	$14,812,418	$15,744,907
Total Operating Expense	$12,283,026	$12,815,694	$13,184,346	$14,828,603
other Expense	$834			
Non-Patient Revenue	$540,036	$866,803	$821,176	$1,087,604
Net Income (LOSS)	$440,691	$590,078	$2,449,248	$2,003,908
Margin	3.68	4.70	16.59	12.73

Source: Lake Region's Medicare cost reports and Lake Region Hospital staff.

Of which is the increase in Medicare payment levels under the demonstration. For the period 1986 to 1988 the hospital's margin had increased from 4.7 percent to 12.7 percent. After adjusting the margin for the effects of the demonstration, the 1988 margin was still a healthy 7.2 percent, i.e., if no demonstration had been conducted, the 1988 margin would have been 7.2 percent.

One factor in the evaluation of the financial effect of the demonstration was the presence of a large health maintenance organization (HMO) that served Medicare beneficiaries during the last part of 1985 through the end of 1987. Beginning in late 1985, HMOs in Minneapolis and other urban areas began to market to elderly beneficiaries in rural Minnesota. The HMOs coordinated their efforts through physicians and clinics in these rural areas, and it is difficult to gauge the effect of the HMO on hospital revenues. In the first quarter of 1988, the HMO withdrew its services to the elderly in this rural area. The HMO-enrolled discharges as a percent of Lake Region Hospital's total discharges plummeted from 22 percent in the fourth quarter of 1987 to 1 percent in the first quarter of 1988. The hospital's percentage of traditional Medicare discharges correspondingly increased from 31.6 percent to 49.6 percent for the same period. Each hospital individually negotiated payment rates with the HMO. Hospital staff reported that the first year's contract with the HMO based the payment on full charges, but the subsequent contract included a discount on charges. It

is impossible to measure the profitability under this arrangement versus the DRG payment schedule without further data.

4.2 Medicare Operating Profit Margins

Data in Table 4-2 provide a measure of the margin accruing to the hospital on its Medicare business alone. These data were gathered to replicate the measure of operating profit margins used by the Office of the Inspector General (OIG) (OIG, Review of the Special Reimbursement Methodology for Rural Referral Centers, July 1988).

The revenues and expenses are summarized with and without the capital pass-through amounts. The following are the major findings of Table 4-2.

1. In FY 1985 and FY 1986 Lake Region Hospital's Medicare operating profit margins were similar to other rural hospitals.

2. During the demonstration, Medicare operating profit margins increased significantly in FY 1987 and FY 1988 and were substantially higher than the average rural hospital.

3. Medicare revenues and admissions were reduced in FY 1986 and FY 1987 because of the HMO penetration of the Medicare market.

As these data show, Lake Region had a positive margin during FY 1985 but this dropped during the following fiscal year. This pattern is similar to the nationwide pattern of falling operating

Table 4-2

Medicare Inpatient Revenues, Expenses, and Operating Profit Margins, Fiscal Years 1985, 1986, 1987 and 1988

	(PPS 2) fiscal Year 1985	(PPS 3) Fiscal Year 19116	(PPS 4) Fiscal Year 1987	Fiscal Year 1988
DRG Payments*	$4,114,530	$3,107,322	$3,418,718	$5,564,039
capital Pass-Through	753,510	585,873	485,644	647,344
Total	$4,868,040	$3,693,195	$3,904,362	$6,201,383
Inpatient Expenses	$3,977,761	$3,053,015	$2,766,907	$4,464,374
Pass-Through	753,510	585,873	485,644	637,344
	$4,731,271	$3,638,888	$3,252,545	$5,101,718
Operating Profit Margin	3.3%	1.7%	19.1%	19.8%

* Includes outlier payments.

Nationwide Operating Profit Margins*

Rural Hospitals (Without Special Designation)	6.6%	0.4%	-3.4%
Rural Hospitals (100 - 149 beds)	7.5%	1.7%	-1.7%
Rural Referral Centers	14.2%	8.5%	3.9%

*Source : Impact of the Medicare Hospital Prospective Payment System 1987 Annual Report

margins for hospitals during the third year of PPS. As shown on Table 4-2, nationwide, the Medicare operating profit margin for rural hospitals without special designations fell to only 0.4 percent by FY 1986 while Lake Region's Medicare operating profit margin for that year was 1.7 percent. While this reflects the national pattern, it also highlights the impact of the HMO on Lake Region's Medicare business. As the data show, there was a drop in Lake Region's total Medicare revenues from 1985 to 1986. While DRG payments were approximately $4.1 million in 1985, they dropped significantly to around $3.1 million in 1986.

The total amount of Medicare DRG payments to Lake Region Hospital was higher in 1987, $3.4 million versus the 1986 amount of $3.1 million. This occurred despite the lower number of Medicare discharges covered in the traditional program, 1,112 in FY 1987, down from 1,630 in FY 1986 (data from Medicare Cost Report). This, again, reflects the impact of the HMO. DRG payments per case for the same period increased by 25 percent, from $2,450 to $3,074. Expenses per case, on the other hand, increased by a much smaller amount, from $2,412 in 1986 to $2,488 in 1987. In summary, the overall operating margin for the hospital's Medicare business in 1987 was not only positive but rose to a significant 19.1 percent. Nationwide, the Medicare operating profit margins for rural hospitals without special designations and RRCs were -2.3 percent and 4.9 percent respectively. Nationwide, the Medicare profit margins for all hospitals were 5.8 percent.

This rate of profit continued for FY 1988, to 19.8 percent as shown in Table 4-2. In that year, the caseload rose again, to 1,619 (cost report data). The severity of Lake Region's caseload intensified during that same year and average DRG payments increased to $3,437. This level of profit margin is realized by very few rural hospitals. Only those in the 90th percentile had mean profit margins of 16.9 percent in the third year of PPS (Prospective Payment Assessment Commission, 1988). If Lake Region Hospital had received the rural hospital payment rate in FY 1988, its Medicare operating profit margin would have decreased to 2.8 percent, which would have been more in line with the national average of 2.2 percent for all hospitals and .8 percent for RRCs.

The effect of the withdrawal of the HMO from Medicare also makes it difficult to say what the financial position of the hospital would have been without the demonstration in years subsequent to FY 1987. It may be that after the HMO withdrew its services in this rural area and enrollees returned to the traditional Medicare program, the hospital would have experienced higher operating margins for its Medicare business.

5.0 CASE-MIX SEVERITY

5.1 HCFA Case-Mix Index

The HCFA case-mix index data in Table 5-l indicate the demonstration hospital serves a more severely ill Medicare patient than either urban or rural hospitals of similar size

Table 5-l

HCFA Case-Mix Index, Lake Region Actual and Comparison Sample Means, 1986

	HCFA Case-Mix Index	Total Discharges	Percent Medicare
Lake Region	1.1994	3,204	39.6%
Samples			
Urban (75-150 Beds)	1.1254	3,476	36.13
Rural (75-150 Beds)	1.1070	3,143	38.9%
Rural Referral Centers	1.1948	7,414	36.2%
Rural Hospitals Heating Demonstration Criteria	1.1840	6,027	49.58

without a current PPS designation (i.e., nonteaching, non-disproportionate share, etc.). While Lake Region's case-mix index was 1.1994 in 1986, a sample of urban hospitals in the North Central Region had an index of 1.1254 and a sample of similar sized rural hospitals in the North Central Region, 1.1070. Lake Region Hospital does serve as severe a case-mix as do RRCs nationwide. In recognition of their high volume of high cost patients, RRCS receive an augmented or higher payment than other rural hospitals. Other data in Table 5-l show values for the set of rural hospitals found to meet a subset of Lake Region's proposed criteria for Rural Secondary Hospitals. Due to data limitations, only a subset of these criteria were applied to rural hospitals nationwide. As the data show, these rural hospitals also have very high case-mix indices, averaging 1.184, and are heavily dependent on Medicare. Given these comparisons, Lake Region does have an unusually intense case-mix, similar to that of RRCs and rural hospitals meeting the demonstration criteria.

The DRG payment system was designed to adjust for these case-mix differences by adjusting urban/rural base payment rates by the DRG relative cost weights. Nonetheless, if Lake Region systematically serves more severely ill patients within a significant number of DRGs, the hospital would experience financial difficulties because the "averaging" expected under PPS would not occur. If, for example, Lake Region serves as a referral center in its local area, it may attract relatively more

severely ill inpatients than the typical rural hospital. A refined DRG measure, accounting for variation within-DRG, is, helpful in analyzing this issue.

5.2 Within-DRG Variation

Two additional measures of case-mix were used to compare Lake Region's index to that of other hospitals. These case-mix indices are derived from SysteMetrics' Disease Staging methodology. Disease Staging is a clinically-based measure that uses objective medical criteria to assess severity on the basis of the etiology and stage of disease progression. Discrete points in the course of individual diseases are identified; these reflect severity in terms of risk of death or residual impairment. Medicare discharge information is used to determine disease category and these stages to create numerous separate, and more discrete, classifications than those employed in the current DRG system.

Discharges in over 20,000 such classifications, or cells, were assigned estimated inpatient costs based on standardized charges from PPS participating hospitals nationwide. Once the dollar values are indexed within each DRG, they form the bases for the within-DRG and across-DRG complexity score. The within-DRG score is derived by dividing the dollar values for discharges in each cell by the mean standardized charge for all discharges in that DRG. The across-DRG measure then weights these scores by the DRG relative weight. These measures are just one. way of adjusting the HCFA case-mix index to reflect the relative severity of hospitals' caseloads.

Once the HCFA case-mix index is adjusted for severity within-DRG, the data show a somewhat different pattern. According to this alternative approach, Lake Region Hospital does not serve as severe a case-mix as either RRCs or the rural hospitals found to meet the proposed criteria. Data for across and within-DRG severity are presented in Table 5-2.

Table 5-2

Across and Within-DRG Complexity Measures,
Lake Region Actual and Comparison Sample Means

	Across-DRG Complexity	Within-DRG Complexity
Lake Region	1.148	0.991
Samples		
Urban	1.111	1.012
Rural	1.080	1.003
Rural Referral Centers'	1.180	1.005
Hospitals Meeting Criteria	1.161	1.016

Although earlier data showed Lake Region serves a mix of DRG cases comparable to that of **RRCs** and "criteria" hospitals, its within-DRG severity is lower. Lake Region's within-DRG complexity measure is 0.991. This means its expected costs are 99.1 percent of the average costs nationwide within the **DRGs** it serves. For the **RRCs** and those meeting the demonstration criteria, the severity of Medicare inpatients is above the mean, 1.005 (100.5 percent) and 1.016 (101.6 percent), respectively. The adjusted case-mix index, or across-DRG index complexity, for Lake Region is lower than that for these two groups, 1.148 versus 1.180 for RRCS and 1.161 for those meeting the criteria. Thus, while Lake Region's expected costs for cases treated are about 15 percent above the national average, those in **RRCs** are about 18 percent above average. The national average for the across-DRG index is 1.000.

Lake Region's across-DRG complexity index, as shown in Table S-2, is higher than its urban and rural counterparts. This is due, however, to the higher number of cases in the high versus low-cost DRG categories. All the comparison samples have higher than average within-DRG severity and, hence, serve cases with higher severity than Lake Region Hospital.

6.0 SUMMARY

A new classification of rural hospitals is neither an effective nor an appropriate mechanism to address the financial problems of rural hospitals. It would appear that the criteria are specific to lake,Region Hospital only. Under the

demonstration payment rate, the overall operating margin for Lake Region Hospital's Medicare business exceeded 19 percent in both FY 1987 and FY 1988. This high level of profit margin is experienced by a very small percentage of other rural hospitals (less than 10 percent). If Lake Region Hospital would have received the rural hospital payment rate, the hospital's operating margins would have been more in line with the national average of all hospitals as well as **RRCs.** In addition, we have no evidence that Lake Region Hospital is in financial trouble and either would close or stop providing medical services to Medicare patients.